Muhammad Ali

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Summary

Competitive programmer (Codeforces Expert peak 1679, CodeChef 4-star peak 1849) with deep expertise in algorithms, data structures, and cryptanalysis. Conducted research on ARX stream ciphers at IIT Hyderabad. Built ML recommendation systems and modern full-stack web applications. Proficient in C++, Python, JavaScript, TensorFlow, and Next.js.

Education

Maharaja Agrasen Institute of Technology, Delhi, India 2021- 2025
B.Tech in Artificial Intelligence and Machine Learning CGPA: 8/10

St. John's Academy, Delhi, India 2021
Senior Secondary Examination CBSE- Class XII (PCM) Percentage: 88.4/100

St. John's Academy, Delhi, India 2019
High School Examination CBSE- Class X Percentage: 92/100

Relevant Coursework

Courses: Object-Oriented Programming, Data Structures and Algorithms, Probability Statistics and Linear Algebra, Computer Networks and Internet Protocols, Operating Systems, Database Management System, Machine Learning, Deep Learning, Data Science, Computational Methods, Natural Language Processing, Mobile Application Development, Cloud Computing

Technical Skills

Languages: C/C++, Java, Python, JavaScript, SQL
ML/DL: TensorFlow, Scikit-learn, NLTK, Pandas, NumPy, Matplotlib
Web/Backend: Next.js, Node.js, Tailwind CSS, Vercel
Other: Git, Unix Shell, MySQL, C++ STL
DSA: Advanced algorithms & data structures (1370+ competitive programming problems solved)

Experience

Research Intern | Center for Cryptography and Cybersecurity, IIT Hyderabad Sep 2025 – Dec 2025

- Implemented reduced-round versions of ARX-based stream ciphers (ChaCha, Salsa, Forró) from scratch in C++ for differential cryptanalysis.
- Designed and evaluated boomerang distinguishers on these ciphers; analyzed success probabilities, time, and data complexities.
- Built tooling to analyze differential propagation, diffusion, and structural weaknesses in modern stream ciphers.

Research Intern | Maharaja Agrasen Institute of Technology Mar 2023 – Jun 2023

- Designed and implemented scalable music recommendation pipelines using TensorFlow Universal Sentence Encoder and Scikit-learn.
- Performed NLP preprocessing and model optimization; co-authored paper presented at ICDAM-2023.

Projects

Personal Portfolio Website | Next.js 14, TypeScript, Tailwind CSS, Vercel (Link) Jun 2025 – Jul 2025

- Built responsive, production-deployed portfolio with server-side rendering and modern UI components.
- Added secure contact form using Resend + Google reCAPTCHA v2 to prevent spam.

Music Recommender | Python, TensorFlow, Scikit-learn, NLTK, Git (Link) Mar 2023 – Jun 2023

- Developed hybrid recommendation system combining collaborative filtering, content-based, and NLP-based approaches.
- Used TensorFlow Universal Sentence Encoder for semantic embeddings; improved personalization and recommendation relevance.

Achievements

Codeforces | BeyonderxX Present

- Peak Rating: 1679 (Expert) Highest Global Rank: 583
- India Rank 5/20,000+ in Codeforces Round 951 (Div. 2)

CodeChef | xbeyonderx Present

- Peak Rating: 1849 (4-star)

Codefest'25 Prelims | IICPC Mar 2025

- Ranked 1263 / 45,000+ in national contest sponsored by HRT, Jane Street, Jump Trading, Citadel, D. E. Shaw